

67/710,722



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Invention: CHEMICAL SEALANT DEVICE FOR REPAIRING  
FLAT TIRES "THE FLAT ANSWER"

Agent's Doc. No.: TAYJ10A

Disk Name: SPEC044K,L,M

BACKGROUND OF THE INVENTION

The instant invention relates generally to tire repair and more specifically it relates to a chemical sealant device for repairing a flat tire automatically while the tire remains in use on the vehicle.

Numerous tire repair kits have been provided in the prior art that are adapted to remove the tire from the rim and plug up punctures in the tire. For example, U.S. patents numbered 3,963,417 to Placek; 4,317,692 to Niconchuk and 4,710,249 to Roberts all are illustrative of such prior art. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purpose of the present invention as hereafter described.

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SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a chemical sealant device for repairing a flat tire that will overcome the shortcomings of the prior art devices.

Another object is to provide a chemical sealant device for repairing a flat tire that includes a valve system built into the tire wheel rim to release at predetermined intervals of rotation the chemical sealant and compressed air when the tire is punctured, thereby preventing a road hazard accident.

An additional object is to provide a chemical sealant device for repairing a flat tire that does away with the fastidious time consuming task of fixing the flat before being able to safely drive.

A further object is to provide a chemical sealant device for repairing a flat tire that is simple and easy to use.

A still further object is to provide a chemical sealant device for repairing a flat tire that is economical in cost to manufacture.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only and that

- 1 changes may be made in the specific construction illustrated
- 2 and described within the scope of the appended claims.

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BRIEF DESCRIPTION OF THE DRAWING FIGURES

The figures in the drawings are briefly described as follows:

Figure 1 is a diagrammatic cross sectional view of a wheel with parts broken away with the instant invention installed therein;

Figure 2 is another diagrammatic cross sectional view taken on line 2-2 of Figure 1;

Figure 3 is a diagrammatic perspective view of the chemical and air vessels of the instant invention;

Figure 4 is a diagrammatic elevational view showing the securement mechanism for the tire chemical sealant vessel;

Figure 5 is a perspective view with parts broken away of the fill inlets;

Figure 6 is a diagrammatic perspective view with parts broken away of the inner torus member;

Figure 7 is a diagrammatic representation of the valve system; and

Figure 8 is a timing diagram indicating the sequence of events in which material is released by the valve system.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the Figures illustrate a chemical sealant device 10 for repairing a flat tire 12 of a wheel 14, which consists of a rim 16 for supporting and fitting the tire 12 thereabout. A mechanism 18 is on the interior of the rim 16 for carrying a portion of the load of the wheel 14 after the tire 12 is punctured and becomes partially flat. Another mechanism 20 is within the carrying mechanism 18, for releasing at predetermined intervals of rotation of the wheel 14, tire chemical sealant 22 and compressed air 24 into the tire 12 so that eventually the tire 12 will be repaired and tire pressured will be at least partially restored, whereby road damage to the tire will be prevented.

The carrying mechanism 18 includes an outer hollow torus member 26 affixed onto the interior surface of the rim 16. The releasing mechanism 20 includes an inner hollow torus member 28 having dual side by side annular chambers 30 and 32, whereby the inner hollow torus member 28 is disposed within the outer hollow torus member 26. A first annular vessel 34 is placed into the first annular chamber 30 of the inner hollow torus member 28. The first annular vessel 34 holds the tire chemical sealant 22 therein. A second annular vessel 36 is placed into the second annular chamber 32 of the inner hollow torus member 28. The second annular vessel 36 holds the

1 compressed air 24 therein. A first valve system 38 is  
2 connected to the first annular vessel 34, so that when the  
3 first valve system 38 is activated by the rotation of the wheel  
4 14, it will release some of the tire chemical sealant 22 into  
5 the first annular chamber 30 of the inner hollow torus member  
6 28. When the first valve system 38 is deactivated by the  
7 continued rotation of the wheel 14, it will release the tire  
8 chemical sealant 22 from the first annular chamber 30 of the  
9 inner hollow torus member 28 into the tire 12 to seal the  
10 puncture. A second valve system 40 is connected to the second  
11 annular vessel 36, so that when the second valve system 40 is  
12 activated by the rotation of the wheel 14, it will release some  
13 of the compressed air 24 into the second annular chamber 32 of  
14 the inner hollow torus member 28. When the second valve system  
15 40 is deactivated by the continued rotation of the wheel 14, it  
16 will release the compressed air 24 from the second annular  
17 chamber 32 of the inner hollow torus member 28 into the tire 12  
18 to inflate the tire 12.

19 The first valve system 38 includes a normally closed  
20 valve 42 between the first annular vessel 34 and the first  
21 annular chamber 30 of the inner hollow torus member 28. A  
22 normally opened valve 44 is between the first annular chamber  
23 30 of the inner hollow torus member 28 and the interior of the  
24 tire 12. A valve stem 46 is connected to the normally closed  
25 valve 42 and the normally opened valve 44 and extends outwardly  
26 from the outer hollow torus member 26. When the wheel 14  
27 rotates the valve stem 46 will be depressed and released at the

1 predetermined intervals. The second valve system 40 includes a  
2 normally closed valve 48 between the second annular vessel 36  
3 and the second annular chamber 32 of the inner hollow torus  
4 member 28. A normally opened valve 50 is between the second  
5 annular chamber 32 of the inner hollow torus member 28 and the  
6 interior of the tire 12. A valve stem 52 is connected to the  
7 normally closed valve 48 and the normally opened valve 50 and  
8 extends from the outer hollow torus member 26. When the wheel  
9 14 rotates the valve stem 52 will be depressed and released at  
10 the predetermined intervals.

11 Figure 8 is a timing diagram indicating the sequence  
12 of events that occur during a half of rotation of the tire when  
13 it has become sufficiently flat as to cause the instant  
14 invention to become operative. It is to be observed that a  
15 short pulse duration occur when the valve systems and the tire  
16 in the vicinity of the valve systems is depressed by coming in  
17 to contact with the roads surface.

18 The chemical sealant device 10 further includes a  
19 first inlet valve 54 on the rim 16, connected to the first  
20 annular vessel 34 so that the first annular vessel 34 can be  
21 filled with the tire chemical sealant 22. A second inlet valve  
22 56 on the rim 16, is connected to the second annular vessel 36  
23 so that the second annular vessel 36 can be filled with the  
24 compressed air 24. A third inlet valve 58 on the rim 16 is  
25 connected to the tire 12 so that the tire 12 can be normally  
26 filled with air.

1 For assembly, the outer hollow torus member 26 is  
2 split into two parts and has cover plates 60, while the inner  
3 hollow torus member 28 is also split into two parts and has  
4 cover plates 62. The first annular vessel 34 and the second  
5 annular vessel 36 are also split into two parts. The first  
6 annular vessel 34 contains male plugs 64 and female sockets 66  
7 so that adhesive 68 can be applied onto the plugs 64 to  
8 properly seal the two parts together. Each part of the second  
9 annular vessel 36 contains right handed threads 70 and left  
10 handed threads 72 at opposite ends so that each of the two  
11 connectors 74 and be threaded thereto to connect the two parts  
12 together.

13 While certain novel features of this invention have  
14 been shown and described and are pointed out in the annexed  
15 claims, it will be understood that various omissions,  
16 substitutions and changes in the forms and details of the  
17 device illustrated and in its operation can be made by those  
18 skilled in the art without departing from the spirit of the  
19 invention.